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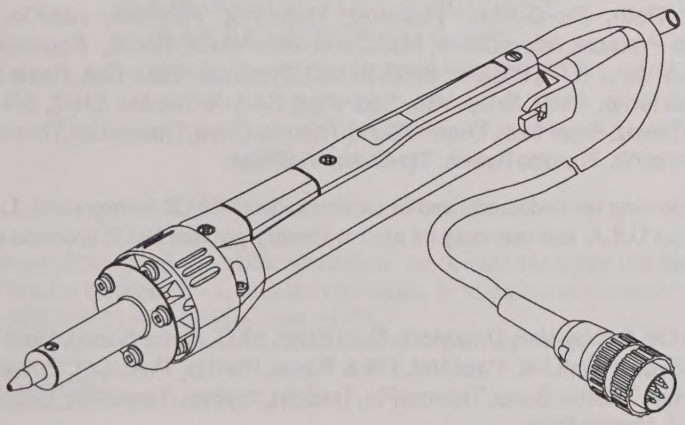
SX-70



SX-70 SODR-X-TRACTOR HANDPIECE

Operation & Maintenance Instructions

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Since 1958, PACE Incorporated has provided advanced technology training in all aspects of hand soldering, rework and repair.

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SX-70
SODR-X-TRACTOR HANDPIECE
PART NUMBER 6010-0077
MANUAL NUMBER 5050-0334
REV. D

These instructions detail the basic operational guidelines for using the SX-70 Sodr-X-Tractor handpiece. A detailed Operation & Maintenance manual (part number 5050-0312) is available from PACE.

Introduction

The SX-70 Sodr-X-Tractor handpiece provides thermally enhanced through-hole desoldering on extra heavy multilayer assemblies, at safer, lower temperatures, even during continuous use and features a large easy-to-clean solder reservoir. The SX-70 also provides safe removal of TQFP (Thin Quad FlatPack) and TSOP (Thin Small Outline Package) surface mount components and continuous removal of old solder from surface mount lands. Its slim-line, pencil grip design and finger actuated vacuum switch facilitates ease of use and manipulation in tight places. The SX-70 is a member of the PACE SensaTemp family of advanced handpieces.

CAUTION

Always return heated handpieces to the appropriate Tip & Tool Stand when not in use. Failure to do so may cause burns to the operator, equipment or work surfaces and may be a potential ignition source if combustible materials are nearby. Always use this handpiece in a well ventilated area to avoid inhalation of fumes created by solder flux.

Handpiece Setup

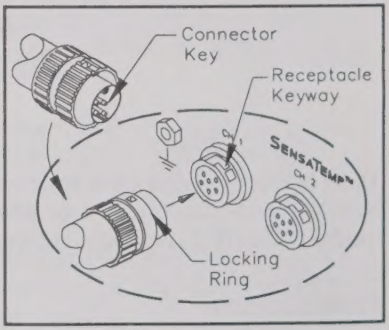
NOTE

If using your SX-70 Sodr-X-Tractor handpiece for the first time or if you have just replaced the heater, we recommend that you follow the "SX-70 Heater Burn-in" procedure (Red tag on handpiece) to increase the life expectancy of the heater.

Use the following procedures to set up your handpiece.

Power Receptacle Connection

Connect the handpiece power cable plug to one of the power receptacles on your PACE power source. PACE recommends that air handpieces utilize the power receptacles closest to the **AUTO SNAP-VAC** (or **SNAP-VAC**) and Controllable **PRESSURE** Ports to minimize cord tangles. Refer to the Operation & Maintenance Manual included with your power source for details.



Air Hose Connection

There are two methods of attaching the air hose from the power source to the SX-70. Select the method which best suits your needs. The quick connect method is best suited for configurations where multiple SensaTemp air handpieces may be in use. The traditional connection method is best suited for single air handpiece configurations.

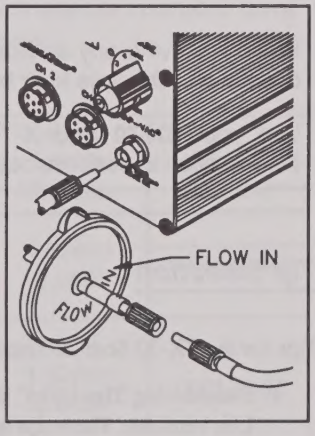
NOTE

Regardless of connection method, ensure that only one air handpiece is connected to either the **AUTO SNAP-VAC** (or **SNAP-VAC**) or Controllable **PRESSURE** Port at one time. Attachment to both ports simultaneously will cause a deterioration of performance.

Quick Connect Method

To set up your SX-70 for quick connect operation, perform the following steps:

1. Attach a 2.5cm (1 inch) length of air hose to the metal tube in the back of the handpiece.
2. To the other end of the 2.5cm (1 inch) air hose, attach a female quick disconnect hose mount fitting (P/N 1259-0086).
3. Prepare a quick connect air hose by inserting a male quick connect fitting into each end of a 137cm (54 inch) length of air hose. You may already have this piece made up if you have other air handpieces configured with the quick connect method.
4. Prepare a VisiFilter in the following manner:
   a) Connect a 2.5cm (1 inch) length of air hose to each side of the VisiFilter.
   b) To the free end of the 2.5cm (1 inch) air hose connected to the FLOW IN side of the VisiFilter, insert a female quick connect hose mount fitting (P/N 1259-0086).
   b) To the free end of the 2.5cm (1 inch) air hose connected to the FLOW OUT side of the VisiFilter, insert a male quick connect hose mount fitting (P/N 1259-0087).
   c) Insert the end of the quick connect hose mount fitting (on VisiFilter FLOW OUT side) into the power source **AUTO SNAP-VAC** (or **SNAP-VAC**) Port.



5. Connect the male fitting of the 137cm (54 inch) length of air hose to the female quick connect hose mount fitting on 2.5cm (1 inch) air hose (connected to VisiFilter) for desoldering, or into the Controllable **PRESSURE** Port for hot air jet operation.

NOTE

When removing any air hose, turn and pull. Do not attempt to pull hose directly off. Damage to or breakage of fitting or VisiFilter may occur. Use your SX-70 Sodr-X-Tractor with a clean VisiFilter element. Otherwise a deterioration in performance or damage to the unit may occur.

Traditional Connection Method

1. Connect the 137cm (54 inch) length of air hose to the metal tube in the back of the handpiece.
2. Insert the ribbed end of a male quick connect hose mount fitting (P/N 1259-0087) into the free end of the 137cm (54 inch) length of air hose.
3. Prepare a Visifilter as described in step 4 of the Quick Connect Method.
4. Connect the male fitting of the 137cm (54 inch) length of air hose to the female quick connect hose mount fitting on 2.5cm (1 inch) air hose (connected to VisiFilter) for desoldering, or into the Controllable **PRESSURE** Port for hot air jet operation.

NOTE

When removing any air hose, turn and pull. Do not attempt to pull hose directly off. Damage to or breakage of fitting or VisiFilter may occur.

Use your SX-70 Sodr-X-Tractor with a clean VisiFilter. Otherwise a deterioration in performance or damage to the unit may occur.

Tip Selection

Tips for the SX-70 Sodr-X-Tractor come in four basic types.

1. **Desoldering Tips** (3/16" shank) Thermo-Drive, Extended Reach and Long Life versions. These tips are tinnable and provide enhanced thermal performance for thru-hole desoldering on high mass boards.
2. **Micro Tips** (1/8" shank) in straight and angled versions. These tips allow easy access into tight places during normal desoldering. The AdapTip (P/N 1360-0083-P1) must be installed in the SX-70 prior to using Micro Tips. Micro Tips also offer convenient cleaning of solder from individual SMT lands.
3. **Pik-Tips** (3/16" shank) provide safe removal of TQFP (Thin Quad FlatPack) and TSOP (Thin Small Outline Package) surface mount components.

4. **Flo-D-Sodr Tips** (3/16" shank) both standard and Long Life versions. These tips provide rapid, continuous extraction of old or excess solder from SMT lands.

Size selection of tips is important. For thru-hole desoldering, select a tip with an I.D. just large enough to allow the lead to freely pass inside. When removing TQFPs or TSOPs, the Pik-Tip should be sized so that the tip blades make proper contact with all the lead/land connections simultaneously.

Available Tips

Shown in the following tables (Tables I, II & III) are partial listing of available tips for the SX-70 Sodr-X-Tractor handpiece. Contact your local authorized PACE distributor for the "Tip and Applications Catalog" which contains a complete list of available tips used with all PACE SensaTemp handpieces.

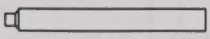
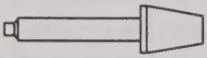
Flo-D-Sodr Tips (3/16" shank diameter)	Outside Diameter	Inside Diameter	Part Number
Flo-D-Sodr Tip 	4.77mm 0.188"	1.52mm 0.060"	1121-0369
Long Life Flo-D-Sodr Tip 	4.98mm 0.196"	1.52mm 0.060"	1121-0465

Table I. Flo-D-Sodr Tips

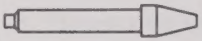
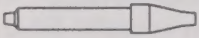
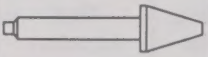
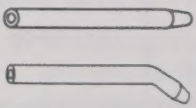
Desoldering Tips	Outside Diameter	Inside Diameter	Part Number
Thermo-Drive 3/16" Shank 	1.52mm (0.060")	0.76mm (0.030")	1121-0367
	1.91mm (0.075")	1.02mm (0.040")	1121-0342
	2.54mm (0.100")	1.52mm (0.060")	1121-0368
	4.8mm (0.190")	2.29mm (0.090")	1121-0507
Extended Reach Thermo-Drive 3/16" Shank 	1.65mm (0.065")	0.76mm (0.030")	1121-00505
	2.16mm (0.085")	1.02mm (0.040")	1121-00494
	2.69mm (0.106")	1.52mm (0.060")	1121-00506
Long Life 3/16" Shank 	1.91mm (0.075")	0.76mm (0.030")	1121-0462
	2.16mm (0.085")	1.02mm (0.040")	1121-0463
	2.69mm (0.106")	1.52mm (0.060")	1121-0464
Micro Tips 1/8" Shank  (Must Be Used With AdapTip P/N 1360-0083-P1)	2.03mm (0.080")	0.76mm (0.030")	1121-0253
	1.78mm (0.070") Thin Wall Tip	0.76mm (0.030")	1121-0485
	2.03mm (0.080")	1.02mm (0.040")	1121-0254
	1.78mm (0.070") Thin Wall Tip	1.02mm (0.040")	1121-0486
	2.54mm (0.100")	1.52mm (0.060")	1121-0255
	2.03mm (0.080") Angled Tip	0.76mm (0.030")	1121-0261
	2.03mm (0.080") Angled Tip	1.02mm (0.040")	1121-0262
	2.54mm (0.100") Angled Tip	1.52mm (0.060")	1121-0267

Table II. Desoldering Tips

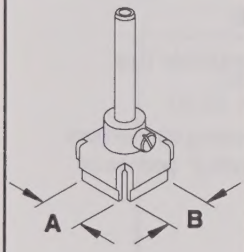
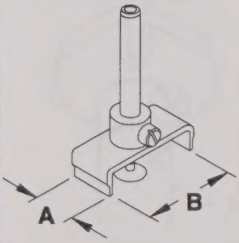
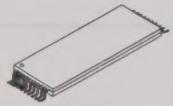
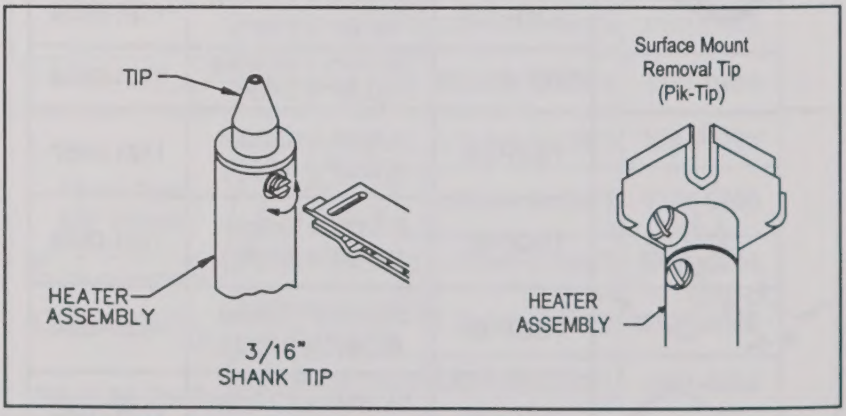
SURFACE MOUNT REMOVAL TIPS (Pik-Tips)			
Pik-Tips	**Description**	**Tip Size A x B**	**Part Number**
	TQFP-28	8.2mm x 8.2mm (0.322" x 0.322")	1121-0571
	TQFP-32	8.7mm x 8.7mm (0.344" x 0.344")	1121-0572
	TQFP-52	12.0mm x 12.0mm (0.472" x 0.472")	1121-0573
	TQFP-40	12.0mm x 12.0mm (0.472" x 0.472")	1121-0574
	TQFP-80	13.2mm x 13.2mm (0.520" x 0.520")	1121-0575
	TQFP-80/100	15.3mm x 15.3mm (0.604" x 0.604")	1121-0576
	TQFP-144	21.6mm x 21.6mm (0.85" x 0.85")	1121-0604
	TQFP-112	22.1mm x 22.1mm (0.87" x 0.87")	1121-0605
	PQFP-80/100	16.8mm x 22.9mm (0.66" x 0.90")	1121-0603
	TSOP-28	8.1mm x 12.7mm (0.320" x 0.500")	1121-0567
	TSOP-32	8.1mm x 19.3mm (0.320" x 0.760")	1121-0566
	TSOP-40	9.9mm x 19.3mm (0.390" x 0.760")	1121-0568
	TSOP-56	14.2mm x 19.3mm (0.560" x 0.760")	1121-0569
	VACUUM CUPS		
	Small	4.4mm (0.175") O.D.	1121-0382-P1
	Medium	7.62mm (0.300") O.D.	1121-0383-P1
	Large	12.7mm (0.500") O.D.	1121-0384-P1
	Kit (w/3 cups)	inc. one of each size	6993-0153-P1

Table III. Surface Mount Removal Tips

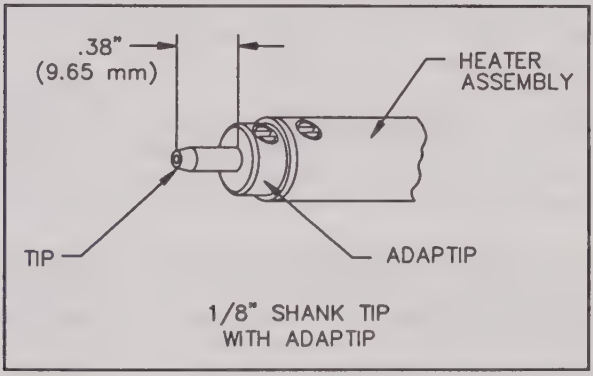
Tip Installation

The following instructions are for tip installation only. If a tip is currently installed in the handpiece, remove the installed tip (heater hot) and clean the heater bore using the supplied wire brushes prior to the installation of a new tip.

1. Select the proper tip for your application. Refer to "Available Tips" tables.
2. Apply power to the handpiece and set the desired operating temperature if the handpiece is cold. Refer to the "Temperature Setting" portion of this manual.
3. Install the selected tip in the following manner.
   a) To install 3/16" shank Desoldering tips, Flo-D-Sodr tips or Surface Mount Removal tips, hold handpiece with the heater end up (heater hot), insert tip all the way and *GENTLY* tighten heater set screw.



b) To install Micro Tips, first insert AdapTip into heater (heater hot) all the way and *GENTLY* tighten heater set screw. While holding handpiece horizontally, insert selected tip into AdapTip opening using the Tip Tool as a gauge, leaving 3/8" (1 cm) of tip extending out of the AdapTip, and *GENTLY* tighten AdapTip set screw.



4. After a short period (1-2 minutes) recheck the tip set screw to ensure that it remains snug.

Temperature Setting

To save tip life and reduce the possibility of damage to the PCB, PACE recommends using the lowest possible tip temperature that will provide rapid yet controllable melt of the entire solder joint. Begin with an operating temperature of 316°C (600°F) and adjust as necessary. Tip temperatures in excess of 399°C (750°F) may cause damage. For safest removal, some components on extra heavy assemblies may require preheating or auxiliary heating.

Tip Temperature Adjustments

Digital Readout Systems

On digital power sources, press the **SET** (or **TIP SET**) Key of the channel powering the SX-70 and enter your desired true operating temperature. When using Pik-Tips, press the **OFFSET** (or **TIP OFFSET**) Key and enter the Tip Offset Constant corresponding to the selected tip listed in the Tip & Temperature Selection System booklet (PACE part number 5050-0251) as required.

Dial Display Systems

The Tip & Temperature Selection System booklet (PACE part number 5050-0251) will indicate the appropriate Temperature Control Dial setting for the listed true operating temperatures of the selected tip. Adjust the Temperature Control Dial accordingly.

Tip Preparation

Proper tip preparation will insure optimum results and increase tip life. Follow this procedure before each component removal or land preparation operation and prior to storage of the handpiece in its Tip & Tool Stand.

NOTE

The use of a PACE Tip Maintenance Station (PACE part number 6993-0138) is recommended for the proper preparation and maintenance of all SX-70 tips. If this item has not been purchased (standard on MBT 250 & PRC 2000 systems), contact your local authorized PACE dealer for assistance.

1. Insure that the installed tip is at set tip temperature.
2. Using a moistened sponge, remove all solder dross and flux residue from the tip.

NOTE

Insure that the sponge material is moist and free of debris. Add water if necessary. Wiping the heated tip on a dry sponge will only contaminate the tip and ultimately the board. It will also significantly shorten the life of the sponge itself.

3. Surface Mount Removal, Thermo-Drive and Thermo-Drive Long Life 3/16" shank tips are tinnable. Using a large gauge, flux cored wire solder, tin the end of these tips. Proper tinning enhances heat transfer to lands and extends tip life. All Micro Tips (1/8" shank) are not tinnable and must be used with the AdapTip.
4. During Flo desoldering or Thru-hole desoldering, on heavily fluxed or contaminated boards, debris may collect inside the tip bore. If this occurs, clean the tip bore with the Sodr-X-Tractor Tip Cleaning Kit (PACE part number 6993-0151).
5. The SX-70 handpiece is now ready for use. If not immediately using the handpiece, store in its Tip & Tool Stand.

Thru-Hole Solder Extraction

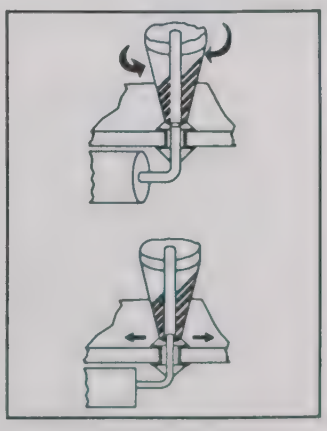
Use the following procedure to obtain the best results in through-hole solder extraction.

1. Ensure that the air hose is connected to a VisiFilter and the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port on the power source. Select an operating temperature that will cause complete solder melt in 2-5 seconds (somewhat longer on heavy multilayer boards). A tip temperature of 316°C (600°F) is recommended for most applications.
2. Position your index finger on the vacuum control switch found on the handpiece. Alternatively, vacuum can be actuated by an optional foot pedal.
3. Gently position the extractor tip over the lead contacting the solidified solder keeping tip perpendicular to the pad and board.

NOTE

Do not apply pressure against the pad at any time during this operation. Damage to the board may result.

4. Gently move the lead ...



a) in a circular motion for round leads

b) in a back and forth motion for flat leads

until the lead moves freely. Free lead movement indicates that complete solder melt has been obtained.

5. While continuing to move lead, actuate vacuum with the finger switch or (foot pedal) and keep on for at least 2 seconds to cool joint and prevent resweating. The length of time from when heat is applied until the time vacuum is started (i.e., complete solder melt) should be 2-5 seconds under normal conditions. Heavy multilayer boards may require somewhat longer heating times. In extreme cases, preheating or auxiliary heating is recommended to achieve the safest results.

NOTE

Premature actuation of the vacuum may result in incomplete removal of solder from the joint being desoldered. Free movement of the lead is the workpiece indicator that proper solder melt has been achieved. In the event that all the solder has not been removed from the hole, the recommended procedure is to resolder the hole and try again after the board has been allowed to cool.

6. Remove tip from pad and continue vacuum application for an additional 2 seconds to insure that all residual solder is drawn into the solder collection chamber.

7. Retin tip using large gauge flux cored solder and return SX-70 to its Tip & Tool Stand.

8. After all leads are desoldered, the component is easily removed. If any solder should remain in the plated thru-hole after extraction, resolder the connection and perform this procedure again.

Surface Mount Component Removal

Component Preparation

Proper preparation is the key to successful component removal. To obtain optimum results, this procedure should be followed.

1. Remove any protective coatings and clean the component leads and land areas using an approved solvent or cleaner.
2. Ensure that the PCB is free of moisture.
3. Preheat the PCB as necessary. PCBs consisting of heat sinking materials (e.g., ceramic, polyamide, etc.) or those with an exceptionally heavy ground or power planes may require the use of a preheating system such as the PACE Heat Wave.
4. In order to maximize heat transfer from the handpiece tip to PQFP component lead/land connections, PACE recommends adding

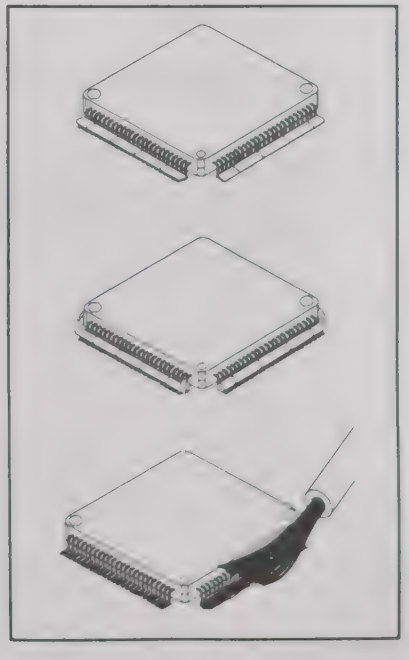
bridgefill .....

solder wrap .....

or

flux .....

to maximize heat transfer across all connections.

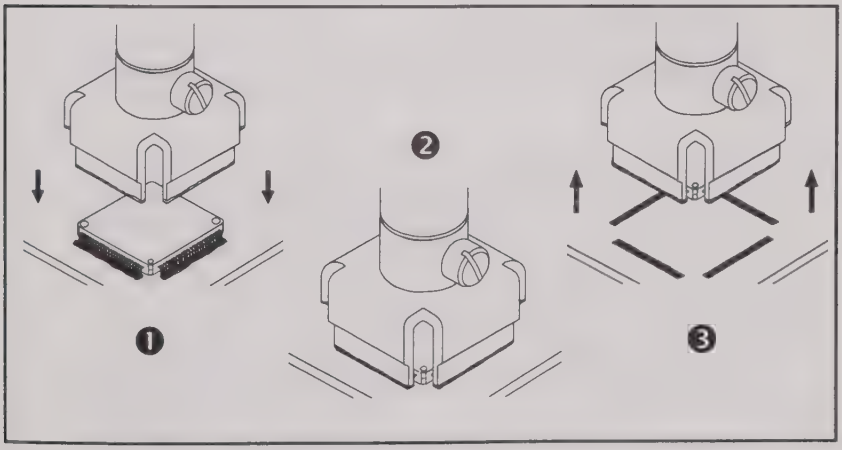


TQFP/TSOP Component Removal

TQFP and TSOP surface mount components can be removed using the SX-70 handpiece and the appropriate Pik-Tip. Use the following procedure to obtain optimum results. The illustrations accompanying the procedure depict a TQFP removal; removal of TSOP components are accomplished using the same procedure.

Procedure

1. Ensure that all Board/Component Preparation has been performed.
2. Start with a tip temperature of 315°C (600°F) and adjust as necessary.
3. Enter Tip Offset Constant for the selected tip.
4. Install vacuum cup to Pik-Tip tube using Tip Tool.
5. Install TQFP (or TSOP) Removal Tip into Sodr-X-Tractor using Tip Tool.
6. Remove old solder from tip with sponge. Tin inside and bottom edges of tip with solder.



7. Lower tip over component contacting **ALL** leads with tip (see ❶&❷).
8. Confirm solder melt of **ALL** joints, apply vacuum and lift component from PCB (see ❷&❸).
9. Release component onto a heat resistant surface.
10. Re-tin tip with solder and return Sodr-X-Tractor to its Tip & Tool Stand.
11. Prepare lands for component replacement.

SMT Land Preparation

Proper land preparation is the key to successful assembly, rework and repair. To obtain optimum results, follow these steps.

1. After component removal, clean the land area of old flux residue using an approved solvent or cleaner.

2. Ensure that the PCB is free of moisture. You may wish to gently dry the land pattern area using a PACE ThermoJet handpiece or Heat Wave preheating or auxiliary heating.

3. Some circuit boards such as ceramic and polyamide as well as those incorporating large ground planes or multilayer technology may require the use of preheating to prevent thermal shock and reduce heat sinking from the component mounting site. The PACE Heat Wave should be used for this purpose as necessary.

4. Apply a thin coat of an approved liquid flux to the lands (optional step).

5. Ensure that the air hose is connected to a VisiFilter and the **AUTO SNAP-VAC** (or **SNAP-VAC**) Port on the power source. Select a tip operating temperature that will cause complete solder melt immediately upon tip contact without causing heat damage to the lands.

6. Install the proper tip for your application.

   a) Install a Flo-D-Sodr tip. The Flo-D-Sodr tip is used for continuous land cleaning.

   b) Install the AdapTip (P/N 1360-0083-P1) and a Micro Tip to individually clean lands.

7. Hold the SX-70 handpiece (with Flo-D-Sodr or Micro tip installed) in a vertical position (tip down) directly over the land where solder is to be removed.

8. Lower the handpiece tip for contact with the solder.

NOTE

Contact between the tip and land must be maintained to obtain maximum thermal linkage. Downward pressure should be minimized to avoid damaging of lands.

9. Complete solder melt should be immediate. Actuate vacuum using the handpiece vacuum control switch or the optional foot pedal.

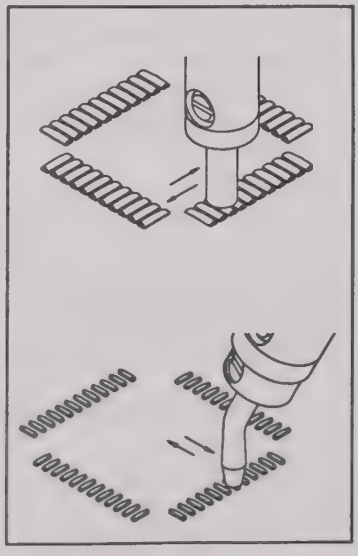
NOTE

If solder melt is not immediate, remove the handpiece and tip. Continued heating without allowing the board to cool to the ambient temperature may cause board damage. Preheating or a higher tip temperature may be required.

10. Sweep the tip (Flo-D-Sodr or angled Micro tip) along the length of each land or row of lands until all solder is removed using the appropriate procedure shown below.

a) Using a Flo-D-Sodr tip, gently contact the solder, activate vacuum and sweep along the length of each row of lands while maintaining vacuum until all solder is removed. After all lands are cleared, continue vacuum for an additional 5 seconds to clear all molten solder from the heater chamber.

b) Using a Micro tip, gently contact the solder. When the solder melts, activate vacuum and sweep along the length of the land until all solder is cleared. Deactivate vacuum and proceed to the next land.



Cleaning Solder Collection Chamber

As the Sodr-X-Tractor is used, solder and flux buildup will begin to impede the air flow and decrease system performance. Regular cleaning of the chamber will keep the Sodr-X-Tractor operating at peak performance.

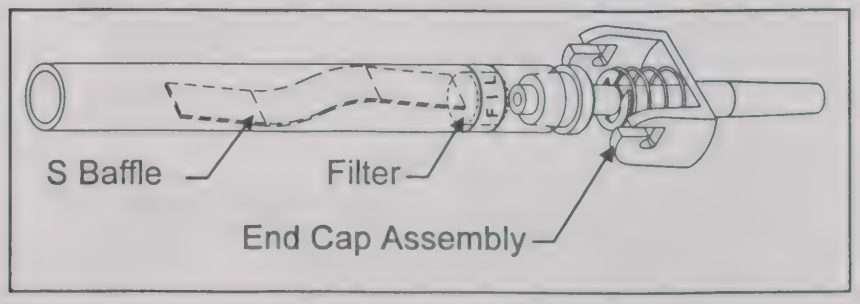
1. Remove any installed tip using the Tip Tool.
2. While holding the Sodr-X-Tractor tip up, remove the End Cap Assembly from the rear of the handpiece. This action is accomplished by pushing the End Cap Assembly toward the front of the handpiece and turning counterclockwise to disengage.

   The glass chamber can be easily removed if it remains in the handpiece when the end cap assembly is removed. Insert a small flat blade screwdriver into the handpiece and gently push the front end of the glass chamber off the front seal.

NOTE

Do not attempt to remove the solder collection chamber (glass or silicone rubber chamber) from the Sodr-X-Tractor using pliers or any like tool. The use of such tools may cause damage to the chamber.

3. To remove the chamber from the End Cap Assembly, grasp the chamber by the end closest to the End Cap Assembly. On a heated extractor this end may be warm to the touch. DO NOT touch the other end as it initially may be too hot to touch. If dropped, a glass chamber is likely to break.



4. Clean and inspect the solder collection chamber in the following manner:
   a) **Glass Chambers** - Push the S Baffle and Filter from the chamber. A bristle brush may be used for this purpose. Check for breaks or cracks in the glass and for broken or rough edges on the ends of the chamber. Replace if any damage is evident.

      Clean the chamber and S Baffle with the large nylon bristle brush which has been wetted with an approved solvent. Run the brush through the chamber several times to remove solder and flux residues which have built-up. If desired, apply mineral oil to the brush and lightly coat the inside of the chamber and the S Baffle.

   b) **Silicone Rubber Chambers** - Remove the Filter and S Baffle from the chamber. Tap the side of the chamber against the side of a waste container to release residual solder. Check for any breaks or deformation of the chamber. After extended use, the ends of the chamber may deform and cause air leaks at the rubber seals (front and rear of handpiece). Replace if any damage is evident.
5. Assemble the solder collection chamber by installing the S Baffle and a new Filter into the chamber. The S Baffle should have enough tension to maintain a constant position within the chamber. Bending of the baffle slightly at the center will readjust the tension. Do not attempt to bend the baffle while installed in the chamber. The Filter must line up with the markings on a glass chamber (just clear of the End Cap Assembly in a silicone rubber chamber) and the rear of the S Baffle should be positioned just touching the Filter.
7. To ensure that the chamber will remain attached to the End Cap Assembly, seat the End Cap Assembly in the chamber and twist to secure in place.
8. Hold the Sodr-X-Tractor with the vacuum control switch in the upright position.
9. Insert the chamber into the Sodr-X-Tractor. Slide the chamber into the handpiece and onto the front heater seal.
10. Inspect for proper seating of the chamber on the front seal.
11. Attach the End Cap Assembly to the Sodr-X-Tractor by pushing forward and turning clockwise to lock into place.
12. Check all air hose fittings. Actuate the vacuum and ensure that proper vacuum flow is present at the tip.

Tip Cleaning

During heavy, continuous desoldering, on boards with flux residues or other contamination, the tip may occasionally become clogged with such material. If this should occur, clean the tip with the Tip Cleaning Kit (PACE part number 6993-0151) by inserting the wire tool into the tip end.

Special Applications

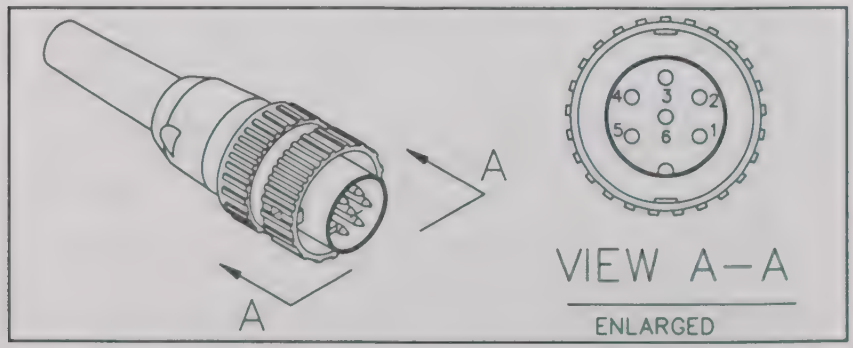
If you require assistance in the use of this handpiece or with a special application, contact PACE Applications Engineering at:

Telephone: (301) 490 - 9860 Fax: (301) 604 - 8782

Corrective Maintenance

Your SX-70 requires no special maintenance other than being kept clean. The heater bore and the heater assembly set screw which secures the tip must be kept free of oxidation and debris in order to maintain the proper tip-to-ground resistance.

Refer to the Handpiece Connector Plug pin out illustration and Table IV for information on troubleshooting most handpiece problems. Disconnect the handpiece from the Power Source and perform the "Heater Assembly Checkout Procedures" with the handpiece (and heater) at room temperature. Use a meter to check resistance across the Handpiece Connector Plug pins as outlined in the "Checkout Procedure" column.



Handpiece Connector Plug

SYMPTOM	CHECKOUT PROCEDURE	CAUSE	SOLUTION
No heat	Check resistance - Pin 2 to Pin 5. Resistance should be 8.2 to 9.5 ohms. If not - -	Open Heater	Replace Heater Assembly
	Check resistance - Pin 3 to Pin 6. If circuit reads open - -	Open Sensor	Replace Heater Assembly
Handpiece overheating	Check resistance - Pin 3 to Pin 6. Resistance should be 110 ohms. If circuit reads less than 105 ohms - -	Shorted Sensor	Replace Heater Assembly
Fuse blows when unit is turned on	Check resistance - Pin 2 to Pin 5. Resistance should be 8.2 to 9.5 ohms. If not - -	Shorted Heater	Replace Heater Assembly
No Ground on Tip	Check resistance - Pin 4 to a NEW Tip. Resistance should be less than 2 ohms. If not - -	Oxidation buildup in Heater Bore	Clean Heater Bore using appropriate wire brush
		Defective Heater	Replace Heater Assembly

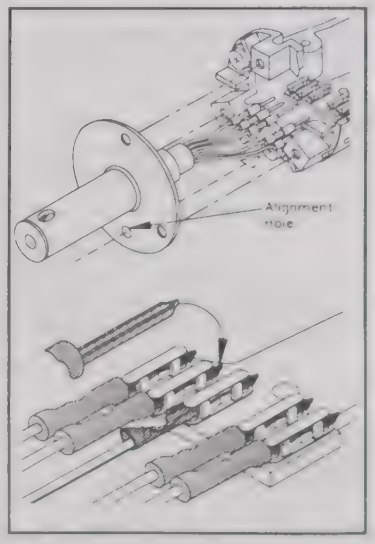
Table IV. Heater Assembly Checkout Procedures

Heater Replacement

Ensure that the heater assembly of your handpiece is defective by referring to the Corrective Maintenance section of this manual. To replace the SX-70 Heater, ensure that the handpiece is at room temperature & perform the following procedure using the illustrations as a guide

1. Remove and set aside any installed tip from the handpiece.
2. Disconnect the SX-70 handpiece from the power receptacle of the power source.
3. Remove the end cap assembly & solder collection chamber from handpiece.
4. Remove the two (2) C Clips located at the rear of the handpiece. Refer to illustration on page 25.

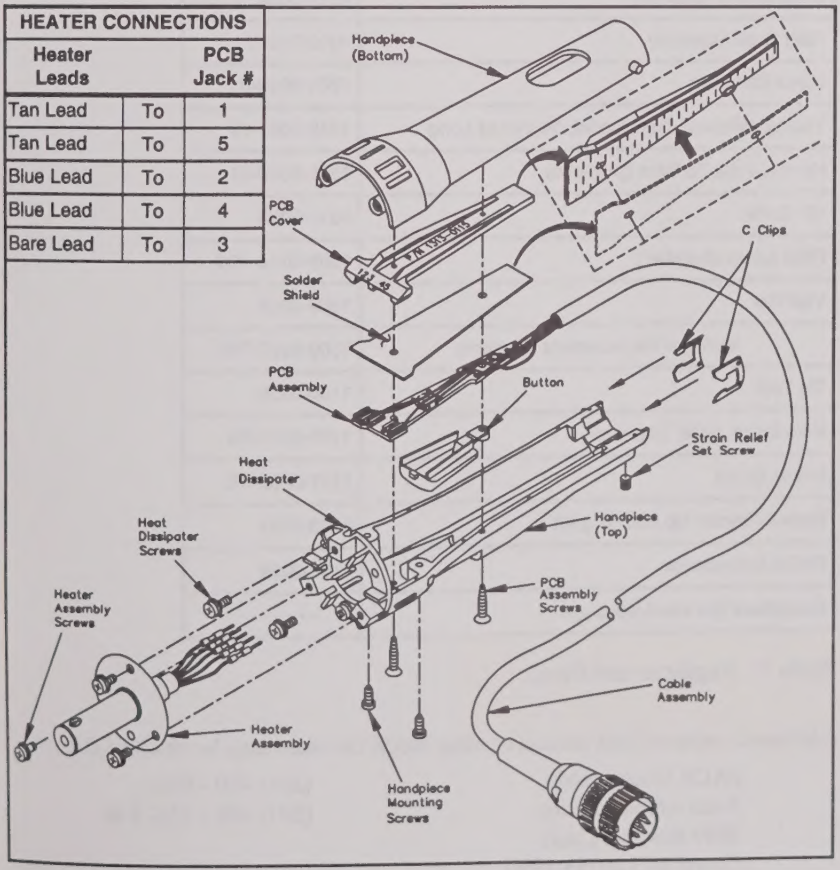
5. Remove the two (2) Handpiece Mounting Screws which secure the top and bottom halves of the handpiece together.
6. Remove the three (3) Heater Assembly Screws. Allow the Heater to hang loose. **DO NOT** pull the Heater from the handpiece at this time.
7. Remove the two (2) Heat Dissipater Screws which attach the Heat Dissipater to the Handpiece (Bottom). **DO NOT** remove the third screw attaching the Heat Dissipater to the Handpiece (Top).
8. Remove the Handpiece (Bottom).
9. Remove the two (2) PCB Assembly Screws. Set the PCB Cover aside. Discard Solder Shield (if present).
10. Disconnect the five (5) Heater leads plugged into the Cord and Switch Assembly. Remove the Heater from the handpiece.
11. Insert the wire leads of the replacement Heater assembly through the Heat Dissipater. Align heater assembly with the Alignment Hole (on heater flange) directly over the Heat Dissipater Screw.
12. Using needle nose pliers, carefully plug the five (5) color coded wire leads of the replacement Heater assembly into the receptacles of the PCB Assembly. Ensure that the leads are inserted as shown with the flat surface of the metal pins down against the PCB. Plug the Tan leads into the jacks along either edge of the pcb (#1 and #5; see PCB Cover markings on illustration). Plug the bare metal lead into the center jack (#3). Plug the two (2) Blue leads into the two (2) remaining jacks (#2 and #4).



13. Place the replacement Solder Shield on the bottom of the PCB Cover, aligning the holes in the Solder Shield with the 2 holes on the cover. Press the hole at the rear (small end) of the Solder Shield over the shoulder (with hole) at the rear of the PCB Cover. This will hold the Solder Shield in position on the cover.
14. Place the PCB Cover (with Solder Shield) back over the PCB Assembly. Attach to the handpiece using the two (2) screws removed in step #9.

15. Reassemble the handpiece in the following order.
    a) Replace the Handpiece (Bottom) removed in step #8.
    b) Replace the two (2) Heat Dissipater Screws removed in step #7.
    c) Replace the three (3) Heater assembly Screws removed in step # 6.
    d) Replace the two (2) Handpiece Mounting Screws removed in step #5.
    e) Replace the two (2) C Clips removed in step #4.
    f) Replace the solder collection chamber and the end cap assembly removed in step #3. Replace the tip.
16. Connect the handpiece to the power source and follow the "SX-70 Heater Burn-in" procedure (Red tag on handpiece) to increase the life expectancy of the heater.

HEATER CONNECTIONS		
Heater Leads		PCB Jack #
Tan Lead	To	1
Tan Lead	To	5
Blue Lead	To	2
Blue Lead	To	4
Bare Lead	To	3



Replacement Parts

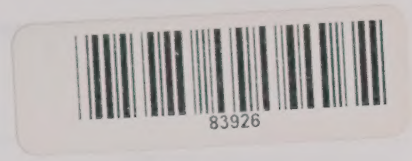
DESCRIPTION	PART NUMBER
Handle Assembly Kit	6993-0140
Heater Assembly	6010-0080-P1
Heater Set Screw	1348-0547-P10
Front (heater) Seal	1213-0033
Cord/Switch Assembly	4010-0098
Rear Seal Assembly	4010-0101
Glass Chamber	1265-0009-P1
Tubing, Silicone, Translucent, 54 Inches Long	1342-0001-13
Holder, Tube To Wire (pkg. of 6)	1321-0085-01
"S" Baffle	4010-0033
Filter (glass chamber)	1309-0018-P50
VisiFilter	1309-0028
VisiFilter Replacement Elements	1309-0027-P50
Tip Tool	1100-0206
Wire Brush, 3/16" Diameter	1127-0014-P5
Bristle Brush	1127-0002-P5
Sodr-X-Tractor Tip Cleaning Kit	6993-0151
PACE Screwdriver	1100-0230
Handpiece tips listed last page	- - - - - - - -

Table V. Replacement Parts

Additional copies of this manual or other PACE literature may be obtained from:

PACE Incorporated
Sales Administration
9893 Brewers Court
Laurel MD 20723-1990

(301) 490 - 9860
(301) 498 - 3252 Fax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